The methodological underdog

THE METHODOLOGICAL UNDERDOG:
A REVIEW OF QUANTITATIVE RESEARCH IN LEADING ADULT EDUCATION JOURNALS

(pre-print Open Access version)

Abstract

Publications in leading adult education journals demonstrate that quantitative research is only limited present. In order to better understand this situation, a review of journal articles reporting on quantitative research is being presented. Differences in methodological strengths and weaknesses between quantitative and qualitative research are being discussed, followed by a data mining exercise on 1,089 journal articles published in *Adult Education Quarterly*, *Studies in Continuing Education* and *International Journal of Lifelong Learning*. A categorisation of quantitative adult education research is being presented, as well as a discussion on why quantitative adult education does not seem to be widespread in the generic adult education journals.

Introduction

This paper aims to explore the nature of quantitative research in adult education. There is limited presence of quantitative research published in the leading journals in the field, such as within *Adult Education Quarterly*, *Studies in Continuing Education* and *International Journal of Lifelong Education*. Exploring research methodologies and methods is important to understand the leading frameworks in which adult education research is currently being conducted and the ways in which new insights are added to the knowledge base. It is not new that empirical studies in the field, as published in leading journals, tend to be dominated by qualitative research approaches (for a discussion see Fejes & Nylander 2015). As a scholar

active in engaging in quantitative research, I aim to provide a synthesis and review of research tools available for adult education researchers from a quantitative perspective. This paper briefly discusses different research paradigms, methodologies and methods as discussed in the academic methodological literature in order to locate quantitative research's place in the 'methodological jungle', but I start with discussing a range of hypotheses on why quantitative research does seems to be underrepresented in the leading adult education journals.

Hypotheses on the limited presence of quantitative research

Before turning to the overview of what quantitative research has to offer to the field of adult education, I start by discussing a range of hypotheses on why quantitative research is clearly less present in the leading journals in the field. Fejes and Nylander (2015) undertook a bibliometric analysis on the top cited articles in *Adult Education Quarterly*, *International Journal of Lifelong Education* and *Studies in Continuing Education* and concluded that 'qualitative approaches have near total dominance'. They included 57 articles in their analysis and found that 7 of these 57 articles included a quantitative component. The empirical aspects of these 7 articles were either purely quantitative or part of a multi-strategy design, combining qualitative and quantitative methods (Robson 2011). Apart from providing data on methodological approaches, the authors also discussed potential explanations for the lack of research using quantitative methods. In general, I tend to agree with these hypotheses, although I would like to offer some comments as well. For example, Fejes and Nylander (2015) discuss the intake of doctoral candidates in the field who are often coming from a practical background, therefore likely more interested in capturing the experiences of adult learners, more likely to result in the choice to adopt qualitative methods. Although

quantitative research is also able to ask about experiences, it is more likely providing an overview of 'what' they are feeling, instead of 'why' they are experiencing these feelings, because of the different nature of questions to be answered when using quantitative research approaches, generally more focussing on static objective data instead of subjective meanings (see Robson, 2011). Researching 'experiences' might thus profit most from qualitative approaches, although it is also possible to combine it with existing quantitative scales, as will be clear from my discussion of research instruments below. Also, professors currently supervising these doctoral students, explain Fejes and Nylander (2015), were likely trained within an era where qualitative methods gained popularity as a reaction to quantitative positivist ideas, perceiving truth as something that can be objectively verified. Based on my personal experience of visiting conferences and discussing work with scholars in the field, I have indeed noticed the dominant qualitative expertise of colleagues, and it is therefore thus not surprising that this mirrors the research output published in leading journals. As will be discussed later, I will also confirm Fejes and Nylander's findings that quantitative research published in the leading journals is mainly undertaken by scholars in the USA and that this seems to limit the presence of quantitative studies published in the *International Journal of Lifelong Education* and *Studies in Continuing Education*, edited in Europe and Australia. Furthermore, argue Fejes and Nylander (2015), exploring the specific aims of the journals, they all make specific reference to the 'relation between theory and practice'. While I believe certain types of quantitative research, e.g. experiments or surveys drawing on psychometric scales have the potential to inform practice too, it is important to further discuss the opportunities of doing so and to raise awareness among scholars of what quantitative research can and cannot inform about. Finally, the authors of the review (Fejes & Nylander 2015) point out that in a difficult funding climate, it is hard to obtain large pots of money to conduct extensive quantitative studies, e.g. longitudinal studies. This might be one of the reasons why

quantitative research is less present, but as I will argue later, there are a wide range of opportunities to work with available secondary datasets free of charge, although it is needed to work with these survey data with a critical approach, as will be discussed in the section on secondary data analysis below.

Before discussing a range of quantitative tools available for researchers based on studies published in the leading journals in the field, I provide a brief overview on historical discussions between the role of qualitative versus quantitative research.

Research paradigms

Thomas (2009, p.72) defines the term paradigm as 'the technical word used to describe the ways we think about and research the world'. He goes on that, following his reading of the methodological literature, the 'leading' research paradigms in social sciences are 'positivism' and 'interpretivism'. It should be noted that other authors discuss the 'paradigm landscape' in a more sophisticated way, e.g. Denzin and Lincoln (2003) who distinguish between 'positivism and postpositivism', 'interpretivism, constructivism and hermeneutics', 'feminism', 'racialised discourses', 'critical theory and Marxist models', 'cultural studies' and 'queer theory', going beyond the binary divide between 'positivism' and 'interpretivism' as discussed by Thomas (2009). Space is limited here to go into detail on all of these separate paradigms, but for a detailed overview on these paradigms mentioned above, Denzin and Lincoln (2003) can be consulted.

Focussing on the core messages, what Thomas (2009), as well as other authors discussing paradigms, want to bring out is that the way we 'think about and research the world' is affecting the way we decide on our research approaches. Positivists, for example, as discussed by Thomas (2009) start from the assumption that knowledge can be obtained in an objective and value-free way, based on facts and figures. Assumptions and methods are

therefore generally borrowed from exact sciences and tend to be concentrated around the use of quantitative methods in order to test or reject a set of hypotheses. It is thus the deductive hypothesis testing type of research interested in presenting 'objective' facts and figures that is perceived as being suitable for quantitative research focussing on questions such as how many, what percentage etcetera,… Interpretivists, on the other hand, start from the perspective of individuals constructing and interpreting the world. Interpretivists' work is concerned with how people are making sense of the world and thus not with the believed objective realities as featured in positivism. Their work is therefore more likely to draw on qualitative methodologies.

In practice, research will often combine elements of quantitative and qualitative approaches instead of strictly separating them. The 'paradigm war', involving academic arguments between those pro- and anti-quantitative positivist approaches, has been widely discussed in the methodological literature, especially during the 1970s and 1980s of the previous Century (see e.g. Gage 1989, Robson 2011). These discussions have also led to the discussion of 'mixed methods research', which could be perceived as an additional paradigm according to Cohen et al. (2011), and which has been labelled as 'the third methodological movement' in the work of Johnson et al. (2007) and Teddlie and Tashakkori (2009) or as the 'pragmatic' approach (Robson 2011). Nowadays, it is believed that there is a tendency for researches to adopt the research approaches best suited to answer their research questions and to avoid polarizing between quantitative versus qualitative approaches, but to focus on their complementarities, or to use mixed methods to answer different research questions relating to the same phenomena (Ercikan & Roth 2006; Teddlie & Tashakkori 2009).

Going back to the field of adult education, we know publications in leading journals are dominated by qualitative research approaches and that quantitative research is the

'methodological underdog' (see e.g. Fejes & Nylander 2015). In order to deepen knowledge on the use of quantitative research in adult education, it is important to undertake a review of existing quantitative work with the aim to better understand its' use in the field.

Review procedure distinguishing between quantitative and qualitative approaches

Before going more into detail about the nature of specific examples of quantitative research in the field of adult education, I outline the procedures I have followed to undertake this review analysis. First of all, I had to decide which keywords would fall under the methodological group of quantitative research and what would count as qualitative research. In order to make a decision informed by the methodological literature, despite categorisations always being artificial to a certain extent, I decided to focus on the distinction made by Creswell (2003, p.17). Quantitative research methods therefore refer to data that are gathered using 'predetermined' instruments such as questionnaires, although data can also be obtained through e.g. experiments. Quantitative research methods are characterised by the fact that these data are being subjected to statistical analyses. On the other hand, qualitative research methods start from questions which tend to be more 'open' and additional ideas for data collection can emerge during the data collection phase. Data can be gathered using a range of methods, including interviews, focus groups or observations. Analysis of these data tends to be text based. Mixed methods research approaches combine elements of both quantitative and qualitative methods.

Based on 1089 journal articles, all published between 2000-2014 in the leading adult education journals, the keywords qualitative, quantitative, interview, focus group, participant observation, questionnaire, regression, correlation, ANOVA (Analysis of Variance)

(examples of common statistical analyses) and (quasi)-experimental design were searched for in order to find out which methodological words – based on Creswell (2003, p.17) – were mostly used in the texts. On additional search was included for the term 'mixed methods'. All original papers published in *Adult Education Quarterly* (AEQ), *Studies in Continuing Education* (SCE) and *International Journal of Lifelong Education* (IJLE) in the past 15 years – from 2000 till 2014 – have been included in the analysis (N=1089), including more than 6 million words of text. These journals were included in order to keep the selection similar to previous research undertaken by Fejes and Nylander (2015), as such, building further on their finding that quantitative research is underrepresented in the leading academic lifelong learning journals.

The data were subjected to a context and text mining analysis undertaken with the help of software packages QDA Miner and WordStat, products developed by Provalis Research. QDA Miner is able to code, analyse and manage big data – in this case all papers from the three leading journals between 2000-2014 – and can be linked to Wordstat, which is able to undertake further analyses on the data, such as exploring co-occurences between keywords, e.g. through cluster analyses presented in dendograms – building taxonomies of keywords – or through proximity plots that map the co-occurrence of specific keywords with chosen target keywords. In short, the programme has done a search on all sentences in all manuscript that contain the different keywords. Afterwards, I have explored papers that mention specific data collection methods in order to distinguish whether these were used as part of the literature review or discussion, or whether the paper reflected on empirical research using these methods. A straightforward example of this is searching for the word 'percentage', which is largely used in e.g. contextual and background section of a paper, without therefore being a paper drawing on quantitative methods. This is also the way in which data are being reported in the section below.

As explained before, the three journals are chosen because of their longstanding contribution to the field and to keep the selection of journals parallel to the review undertaken by Fejes and Nylander (2015). Additionally, the journals represent editorial responsibility in three different continents. AEQ is an American journal, IJLE is edited in the Europe and SCE in Australia.

Results

General patterns

This results section discussing the prevalence of quantitative research in the three leading adult education journals starts by demonstrating the underrepresentation of papers mentioning the use of quantitative research approaches (see Table 1).

Table 1: general patterns of data collection methods

Qualitative	**498**	**Quantitative**	**191**
Interview	429	Questionnaire	131
Focus group	68	Regression	38
Participant observation	32	Correlation	26
Mixed methods	8	ANOVA	17
		Quasi-experimental design	3

Source: own analysis

The numbers reported in this table represent the number of cases (journal articles) in which one of these words has appeared, with an additional scrutinising exercise for the keywords reflecting on specific data collection methods.. It does not reflect how many times this word has been mentioned in the 1089 articles, but reflects on the number of articles that use these

methods.. Although this is a keyword search only, it does provide us with a first impression that research reporting on qualitative research is significantly more common than on quantitative research, which is a confirmation of what Fejes and Nylander (2015) found as well, although their analyses were based on top cited papers only. Furthermore, it is also clear that a high volume of papers does not contain any of these keywords at all, as 1089 articles were taken into account. Publications in adult education journals are therefore not automatically empirical in nature, but can also take the form of e.g. policy or theoretical reviews.

This new analysis thus includes all papers of the last 15 years in the same journals, but the conclusion about the dominance of qualitative research approaches remains valid. Especially more specialised quantitative terms such as 'regression' only appeared in 38 journal articles (3.5 percent of the entire database), a keyword one would expect to see in a range of quantitative studies. Correlation was mentioned in 26 papers, of which 11 also mentioned regression analyses. In general, it seems that the majority of qualitative projects is based on interview studies, the majority of quantitative projects on questionnaire studies without engaging in advanced statistical analyses of the data. Experimental designs have been searched for but seem to be mostly absent from the adult education literature as published in the leading journals. Only three papers mentioned they were the result of quasi-experimental research and it is also interesting to see how 'mixed methods' studies are not that strongly represented in the leading adult education journals.

Although quantitative research is thus not well represented in adult education research, it is important to understand what we can learn from existing research to improve the quality of our own research. In short, there are two ways in which scholars can deal with quantitative data: (1) based on primary data collected by researchers themselves, or (2) secondary data collected by others, usually international agencies, on which researchers can work further.

While primary data are newly collected data, it is not uncommon that specific questions in the questionnaire are being borrowed from existing questionnaires used by others before. More information about the use of primary data in quantitative research and tools available to borrow from the adult education literature have been reviewed below. Afterwards, a similar discussion will be presented in relation to secondary data analysis.

Primary data in quantitative research

As stated by Robson (2011), fixed research designs often draw on quantitative measurements, either through experiments or surveys. Based on a review of the adult education literature in three leading journals, it became clear that most quantitative research is based on questionnaire studies, not on experiments. Collecting facts with the aim to observe trends and quantify these trends is commonly labelled as survey research and one of the major aims of quantitative research (Andres, 2014, Bryman, 2012). In setting up a survey, the researcher will have to make decisions on how to sample, but also on how to formulate the specific questions that will be asked, which is extremely important as these questions cannot be changed anymore once data collection has started. Cohen et al. (2011), drawing on work by Sellitz et al. (1976), discuss the need to make clear decisions on the content of the questions, but also the way in which these questions are worded. Questions can be open, leaving room to the respondent to formulate his/her own answer, but quite often, specific answering options will be formulated, e.g. through checklists, Likert Scales, drop down lists or rating exercises. Last but not least, the sequence of the different questions in the overall survey is also extremely important, grouping questions that are similar in content. The formulation of questions will also depend on the choice of survey methodology (Fink, 1995). Asking respondents to complete the survey online or through postal service is different from

conducting a telephone or face-to-face interview where additional explanations can be given on key terms, although no further questions are supposed to be asked, as surveys are usually entirely structured and fixed (Brinkmann & Kvale 2014).

In starting a new survey questionnaire, existing survey questionnaires can be explored. Borrowing questions that have been used before will increase the validity and reliability of your results.Another layer of validity and reliability can be added if measurement instruments have gone through a pilot phase. So what information and tools to use in our own adult education research can we find in the leading journals in the field? While researchers have produced too many questionnaires to discuss in detail here, it is important to review existing standardised scales as these are helpful research tools for a variety of reasons. These scales can be used in new settings not explored before, can further increase the validity and reliability of these measurement instruments and can be used to refine theory based on them. A search for the keyword 'scale' within the text mining exercise demonstrates that the word had been used in 334 papers, although often not specifically in the context of research methods. Therefore, an additional screening was undertaken to filter out the specific measurement scales used by adult education scholars in the past 15 years. Despite the limited presence of quantitative research in these journals, a number of scales were found, most of them based on a range of items measured through typical Likert scales (e.g. 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree) (Likert, 1929). Having explored and reviewed measurement scales' content, I decided to group them into four categories: (1) participation scales, (2) experiences scales, (3) psychometric scales and (4) learning styles scales. Results of the review are being discussed using these four categories.

TABLE 2: overview of quantitative scales as found in the leading adult education journals

PARTICIPATION SCALES	EXPERIENCES SCALES	PSYCHOMETRIC SCALES	LEARNING STYLE SCALES

Education Participation Scale *Isaac et al. (2001)* *Boshier et al. (2006)*	Noel-Levitz Adult Student Priorities Survey *Giancola et al. (2008)*	Motivated Strategy for Learning Questionnaire *Justice and Dornan (2001)*	Personal Responsibility Orientation to Self-Direction in Learning Scale *Stockdale and Brockett (2011)*
Reasons for Participation Scale *Mulenga and Liang (2008)*	Power and Influence Tactics Scale Problem Solving Inventory *Hendricks (2001)*	Abbreviated Math Anxiety Scale Mathematics Self-Efficacy Scale Self-Description Questionnaire III-Math Subscale *Jameson and Fusco (2014)*	Oddi Continuing Learning Inventory *Harvey et al. (2006)*
Adult Attitudes towards Adult and Continuing Education Scale *Blunt and Yang (2002)*		Beck Anxiety Inventory *Carney-Crompton and Tan (2002)* Academic Self-Efficacy Scale Parental Self-Efficacy Scale Work-Family Balance Scale Extended Satisfaction with Life Scale *Van Rhijn and Lero (2014)* General Self-Efficacy Scale *Bath and Smith (2009)* Self-Concept and Perceived Problem-Solving Skills Scales *Porras-Hernandez and Salinas-Amescua (2012)* Borg CR-10 scale *Piirainen and Viitanen (2010)*	Student Engagement Questionnaire *Lee (2014)* Approaches to Supervision Scale Supervision Practices Scale Supervision Outcome Scale *Lizzio et al. (2005)*

<u>Participation scales</u>

First of all, and probably the most well-known scales in adult education research related to **participation** in adult education. The following scales were found based on the analysis in

QDA Miner. Boshier (1973) developed the *'Education Participation Scale'* as a further empirical testing and validation of Houle's typology of adult learners, distinguishing between goal-oriented, activity-oriented and content-oriented learners (Houle 1961). In the past 15 years, the scale has been used to discover the motivations of African American adult learners in church-based education (Isaac et al. 2001). Boshier was also involved in a project measuring the motivation of adult learners in Shanghai, measured through his Education Participation Scale (Boshier et al. 2006). While Mulenga and Liang (2008) refer to Boshier's scale, they used the *'Reasons for Participation Scale'* developed by Steele (1984) to measure participation of adults studying at the Open University in Taiwan. Factors discussed were 'keeping up and fulfillment', 'intellectual stimulation', 'escape and social contact' and 'adjustment'. Another scale developed to specifically predict participation behaviour in adult education is the *'Adult Attitudes towards Adult and Continuing Education Scale'* (Blunt & Yang 2002). Their scale consists of nine items relating to three factors: 'enjoyment of learning', 'importance of adult education' and 'intrinsic value'. Drawing on attitudinal work undertaken by Fishbein and Ajzen (1975) to explain planned and intended behaviour, Blunt and Yang (2002) expand on the importance of positive attitudes towards learning in relation to adult education participation.

Scales measuring learning experiences

A second group of scales found in the leading journals relates to the **experiences** of adult learners, mainly in relation to their participation in a specific setting. While 'experiences' are often perceived as ideally measured through qualitative research (e.g. Thomas 2009), quantitative scales equally attempt to capture feelings and experiences, although the presentation of the analysis will be more static and numerical, answering 'what' or 'how' people feel, instead of 'why' they feel a certain way. The following scales were identified.

Giancola et al. (2008) used the '*Noel-Levitz Adult Student Priorities Survey'* which consists of a scale with 50 items, divided into eight subscales on 'academic advising', 'academic services', 'admissions and financial aid effectiveness', 'campus climate', 'instructor effectiveness', 'registration effectiveness', 'safety and security' and 'service excellence' in order to study the differences between priorities of adult versus first generation students. Experiences in relation to program planning in adult education, from the perspectives of both students and staff members were measured through the *'Power and Influence Tactics Scale'* (POINTS) and the *'Problem Solving Inventory'* in the work of Hendricks (2001). The authors argue for a further testing of the POINTS instrument in order to enhance the reliability of the scale and to test the construct of power and influence in a wider range of settings with diverse samples. To date, no other research using POINTS has been published in one of the three leading adult education journals.

Psychometric scales

Scales are often used in psychological – **psychometric** – research and it is thus not surprising to see that, based on the analysis, a group of measurement instruments relate to concepts like anxiety and self-efficacy and these type of scales can be identified as a third type. The *'Motivated Strategy for Learning Questionnaire'* was used by Justice and Dornan (2001) to explore metacognitive differences between traditional and non-traditional students and focuses on factors like test anxiety, self-efficacy and self-regulation. Anxiety in relation to mathematics courses was assessed by Jameson and Fusco (2014) using items from the *'Abbreviated Math Anxiety Scale'* as well as the *'Mathematics Self-Efficacy Scale'* and the *'Self-Description Questionnaire III-Math Subscale'*. Anxiety has also been a central feature of the work conducted by Carney-Crompton and Tan (2002) on the performance of functioning of female non-traditional students in Canada. They used the *'Beck Anxiety Inventory'* which consists of 21 anxiety items and which has, according to previous research,

a strong internal consistency. Self-efficacy has also been the main variable in research conducted by Van Rhijn and Lero (2014) with Canadian student parents. They used the *'Academic Self-Efficacy Scale'* as well as the *'Parental Self-Efficacy Scale'*. Also the *'Work-Family Balance Scale'* was included in their measures. The project revealed that parent students' self-efficacy matches their satisfaction in relation to being a student and a family member, with satisfaction measured through use of the *'Extended Satisfaction with Life Scale'*. Apart from the academic and parental scales, there is also a *'General Self-Efficacy Scale'* which had been used by Bath and Smith (2009) to analyse propensities of lifelong learners. In understanding the non-participation of adults, Porras-Hernandez and Salinas-Amescua (2012) worked with the *'Self-Concept and Perceived Problem-Solving Skills Scales'* and found that non-participation of poorly educated women cannot solely explained by their dispositional characteristics. A scale that is different from the previous ones but which probably best fits in the category on psychometrics is the *'Borg CR-10 scale'* used by Piirainen and Viitanen (2010) in a project on community development based on individual expertise.

Scales measuring learning styles

A fourth group of scales as found in the leading journals relates to **learning styles**, some of them specifically focussing on self-directed learning. The following scales were found. Stockdale and Brockett (2011) reviewed the literature on self-directed learning and developed a new *'Personal Responsibility Orientation to Self-Direction in Learning Scale'* (PRO-SDLS), providing the scholarly community with an improved measurement instrument replacing the *'Self-Directed Learning Readiness Scale'* (Guglielmino 1977). Another instrument to study self-directed learning, the *'Oddi Continuing Learning Inventory'* (OCLI) was used by Harvey et al. (2006), proposing a four factor structure based on 'learning with others', 'learner motivation/self-efficacy/autonomy', 'ability to be self-regulating' and

'reading avidity'. The development and learning of students has also been studied using a modified version of the *'Student Engagement Questionnaire'* by Lee (2014) which consists of a range of items related to 'critical thinking', 'self-managed learning' 'adaptability', 'problem-solving', 'communication skills', 'interpersonal skills and group work', 'computer literacy', 'active learning', 'teaching for understanding', 'feedback to assist learning', 'assessment', 'teacher-student relationship' and 'student-student relationship'. Within the specific context of supervision for practising psychologists, Lizzio et al. (2005) constructed the *'Approaches to Supervision Scale'* to analyse supervisees perceptions of teaching and management approaches used during the supervisory process, one in relation to themselves and one in relation to the approaches used by their supervisor. These scales were conducted together with a *'Supervision Practices Scale'* and a *'Supervision Outcome Scale'* to measure the use of supervision techniques and the effectiveness of supervision.

Secondary data in quantitative research

For researchers interested in undertaking quantitative research, there is also an option to use existing datasets. Technically, every use of an existing dataset can be labelled as 'secondary data analysis', although generally speaking, one is inclined to think about the major datasets as collected by leading international organisations, e,g. the OECD, the Organisation for Economic Co-operation and Development (Smith 2008). Smith (2008, p.37) argues that *'secondary data analysis remains a relatively underused methodological technique in in the social sciences'* and also focuses on the limited use of quantitative research in education generally. The lack of quantitative research is thus not only present in adult education research, but also within the broader field of education. One of the reasons Smith (2008) puts forward why scholars might feel sceptical about the use of secondary data might relate to the quality of data, e.g. the level of missing values and measurement errors. Furthermore, she says, scholars might not like the fact that these data are 'socially constructed', reducing the

complexity of life into a range of digits. The trust in statistics is generally not very high because of its manipulative power. However, as Smith (2008) goes on, the pitfalls need to be judged against the strengths of working with secondary data. First of all, existing datasets can be used multiple times and explored from different angles, being used to advance both theoretical insights and methodological approaches. Datasets are often available to scholars at a low or no price, which is certainly true for the adult education field. Nowadays, these data are also used for evidence based policy making, e.g. through working with benchmarks and indicators as means of putting peer pressure on a wide range of countries, in order to strengthen education policy making (Holford & Mohorcic-Spolar 2012). Journals' aims of reflecting on practice, as pointed out by Fejes and Nylander (2015) might thus also include working with these quantitative data. However, it remains important to understand that secondary data sources were initially produced for another purpose than the own research to be undertaken. Surveys constructed by e.g. the OECD or Eurostat are being designed to serve a specific policy agenda, such as understanding the role of education and skills in relation to economic prosperity.

Currently, one of the major datasets of interest to adult education scholars is based on data from PIAAC's (Programme for the International Assessment of Adult Skills) Survey of Adult Skills, organised by the OECD. While it is too early to make an overview of articles drawing on data from PIAAC, it is possible to explore how widely researchers in the field have published analyses using data from other large scale surveys, an analysis I will further explore based on the use of the International Adult Literacy Survey (IALS) in the three leading journals.

The International Adult Literacy Survey was also organised by the OECD and was conducted in three waves between 1994 and 1998 (Desjardins et al., 2006, p.28). Given this time span

and given the time needed to make datasets ready for use in research projects, it is expected that analyses of these data have been published in the early 2000s. While other surveys exist, Desjardins et al (2006, p.27) mention that IALS 'is one of the most complete of all surveys undertaken'. Other OECD sources mentioned by Desjardins et al. (2006, p.28-29) are:

- 'the International Adult Literacy Survey (IALS)'
- 'the Adult Literacy and Lifeskills Survey (ALL)',
- 'the Thematic Review on Adult Learning (TRAL)' and
- 'the Programme for the International Assessment for Adult Competencies (PIAAC)'.

Those working in the European context might also be interested in working with surveys conducting within EU countries that measure specific adult and lifelong learning aspects. These include:

- 'the European Labour Force Survey (LFS)',
- 'the Adult Education Survey (AES)',
- 'the Continuing Vocational Training Survey (CVTS)',
- 'the European Survey on Working Conditions (ESWC)' and
- 'the Eurobarometer on lifelong learning'.

While I do not have the space to go into detail exploring each individual dataset, all of them are relevant for adult education research as the questionnaires of these surveys explicitly measure participation in learning and training activities. Currently, PIAAC and the European surveys are being updated by new waves of data collection.

Nowadays, most of these data are available free of charge, e.g. PIAAC data can be downloaded for free from the OECD website. All datasets are backed up by extensive guides, such as codebooks, reports focussing on sampling procedures, survey methods and quality of data. These are also downloadable for free.

Going back to the data mining exercise, results indicate that *International Journal of Lifelong Education* had nine hits for the key term 'IALS', but has in fact only one research article that draws on data from the Survey in an aggregated form (Bathmaker 2007). *Studies in Continuing Education* has four hits for IALS, but none of the papers can be classified as an example of secondary data analysis using data from IALS. The term has thus been used within another section such as within the literature review. *Adult Education Quarterly* even only shows two hits for IALS, none of them analysing data from IALS. The paper from Rubenson and Desjardins (2009) exploring the Bounded Agency Model refers to IALS but draws on data from the Eurobarometer 2003. Searching for the full key term 'International Adult Literacy Survey' instead of the acronym IALS does not increase the number of papers that can be classified as secondary data analysis papers.

What about another dataset then? The specific adult education dataset provided by the European Commission is based on the Eurostat Adult Education Survey (AES). *Adult Education Quarterly* does not have any papers drawing on secondary data from these datasets. In *Studies in Continuing Education*, I found one paper (Boeren 2011). In *International Journal of Lifelong Education*, I found two papers that draw on aggregated data from AES. One by Broek and Hake (2012) in relation to adults' participation in higher education and one by Roosmaa and Saar (2012) on non-formal education in the old EU member states.

The limited availability of research drawing on secondary data analyses in our field might indicate the limited interest or lack of skills in working with these data.

Limitations, discussion and conclusions

The use of different methods and methodologies in a field of research can enhance the quality of research through exploring similar topics from different angles, employing different empirical approaches, e.g. through the combination of collecting data on facts and figures by means of quantitative research and deepening out the further understanding of why certain facts exist (Robson 2011). Based on previous research by Fejes and Nylander (2015), but also confirmed in an additional review undertaken by myself, there is no doubt that the leading academic journals in the field of adult education feature more qualitative than quantitative studies. One of the limitations of both studies (my own and the one by Fejes and Nylander) is that they exclusively focussed on the leading generic adult education journals, not focussing on other types of social sciences journals. However, in case of more quantitative research being available in other outlets, the question then remains why it does not end up in the three leading journals? Why does quantitative research remain underrepresented in these journals and what can be done about this situation? In the last section of this text, I will expand on some suggestions the field might want to consider.

First of all, returning to the hypotheses mentioned earlier in this paper based on work by Fejes and Nylander (2015), I want to elaborate on the likely existence of a skills deficit in the field and thatnew researchers and PhD students are unlikely to undertake quantitative research if their supervisors or mentors are also not working within numerical data. However, in times where our field – and in fact not only our field – is dominated by a focus on 'big data' and the use of benchmarks and indicators, both by the European Commission, the OECD and UNESCO (United Nations Educational, Scientific and Cultural Organization), it would be a pity if our field would miss this boat and not publish more high quality papers in our leading journals based on data from e.g. the Eurostat Adult Education Survey, the Labour Force Survey, PIAAC's Survey of Adult Skills, or indeed a range of high quality datasets available at the country level. It would be interesting to undertake research on whether adult

education researchers feel reluctant in working with these large scale survey data because of their specific nature, e.g. dominated by the economic focus of the OECD and the European Commission, or whether scholars feel not confident in working with quantitative data because of the absence of quantitative skills training available to them. Without this type of research, claims about the limited presence of quantitative research remains largely hypothetical and thus needs to be dealt with carefully. An example of an initiative open to scholars worldwide to increase quantitative skills is the Essex Summer School in Social Science Data Analysis (see http://www.essex.ac.uk/summerschool/). Researchers can take stand-alone courses or combine them towards a Master's qualification. Courses are offered at introductory, intermediate and advanced level. It is also interesting to know that the European Commission organises data user conferences for researchers who use data from e.g. the Labour Force Survey or the Adult Education Survey (European Commission 2015). Attending these events might increase scholars' understanding of how colleagues work with large scale data and for those working with these data, it might be an opportunity to put adult education research more into the picture. However, it might be that adult education scholars have no interest in participating in these events or that they do not have the time or resources to attend.

Secondly, it might be needed to produce more methodological guides specifically focussing on adult education research. In recent years, a number of high quality books on research methods for education and social sciences have appeared (e.g. Cohen et al. 2011, Robson 2011), but as with many general books on education, examples are often taken from research on compulsory schooling, not adult education. It is recommended to have a stronger exchange about research methodologies at research conferences through e.g. organising symposia on methodological aspects of adult education research exploring the strengths of what quantitative methods in the field can offer, instead of solely focussing on content

specific aspects of the field, including theoretical and policy-oriented contributions As a researcher engaging in quantitative research, I would hope that these debates and an increased level of information about methodological opportunities in the field would encourage more researchers to explore quantitative research and to lower the barriers for researchers who might fear that their research might not fit in the dominant discourses in the field and that their work will be evaluated in a sceptical way because of the unfamiliarity of many fellow researchers about the specific methods they have used. As explored above, research approaches are ideally chosen based on the specific research questions we want to answer and there is no doubt that the field can still answer a lot of interesting questions that would profit from being investigated using quantitative methods, as long as researchers are aware of a range of existing validated scales, appropriate statistical techniques and the types of questions requiring a quantitative approach.

References

Andres, L 2014, *Designing and doing survey research,* SAGE, London.

Bandura, A 1977, *Social learning theory*, Prentice Hall, Englewood Cliffs.

Bath, D & Smith, C 2009, 'The relationship between epistemological beliefs and the propensity for lifelong learning', *Studies in Continuing Education,* vol. 31, no. 2, pp. 173-189.

Bathmaker, AM 2007, 'The impact of *Skills for Life* on adult basic skills in England: how should we interpret trends in participation and achievement?', *International Journal of Lifelong Education,* vol. 26, no. 3, pp. 295-313.

Boeren, E 2011, 'Gender differences in formal, non-formal and informal adult learning', *Studies in Continuing Education*, vol 33, no. 3, pp. 333-346.

Boeren, E 2011, *Participation in adult education, a bounded agency approach,* Katholieke Universiteit Leuven, Leuven.

Boeren, E 2016, *Lifelong learning participation in a changing policy context, an interdisciplinary theory,* Palgrave-Macmillan, Baskingstoke.

Blunt, A & Yang, B 2002, 'Factor structure of the Adult Attitudes toward Adult and Continuing Education Scale and its capacity to predict participation behaviour: evidence for adoption of a revised scale', *Adult Education Quarterly,* vol. 52, no. 4, pp. 299-314.

Borg, T 2012, 'The evolution of a teacher community of practice: identifying facilitating and constraining factors' *Studies in Continuing Education,* vol. 34, no. 3, pp. 301-317.

Boshier, R, Huang, Y, Song, Q & Song, L 2006, 'Market socialism meets the lost generation: motivational orientations of adult learners in Shanghai', *Adult Education Quarterly,* vol. 56, no. 3, pp. 201-222.

Broek, S & Hake, B 2012, 'Increasing participation of adults in higher education: factors for successful policies', *International Journal of Lifelong Education,* vol. 31, no. 4, pp. 397-417.

Brinkmann, S & Kvale, S 2014, *Interviews: learning the craft of qualitative research interviewing,* SAGE, London.

Bryman, A 2012, *Social research methods,* Oxford University Press, Oxford.

Carney-Crompton, S & Tan, J 2002, 'Support systems, psychological functioning, and academic performance of non-traditional female students', *Adult Education Quarterly,* vol. 52, no. 2, pp. 140-154.

Cohen, L, Manion, L & Morrison, K 2011, *Research methods in education,* Routledge, London.

Creswell, J 2003, *Research design: qualitative, quantitative, and mixed methods approaches,* SAGE, Thousand Oaks.

Denzin, NK & Lincoln, YS 2003, *Handbook of qualitative research,* SAGE, London.

Desjardins, R, Rubenson, K & Milana, M 2006, *Unequal chances to participate in adult learning, international perspectives,* UNESCO, Paris.

Ercikan, K & Roth, W 2006, 'What good is polarizing research into qualitative and quantitative?', *Educational Researcher,* vol. 35, no. 5, pp. 14-23.

ESRC 2015, *Secondary data analysis initiative, newsletter February 2015*, ESRC, Swindon.

European Commission 2015, *Call for papers, microdata from Eurostat, 4th European user conference*, European Commission, Brussels.

Fejes, A & Nylander, E 2015, 'How pluralistic is the research field on adult education? : Dominating bibliometrical trends, 2005-2012', *European Journal for Research on the Education and Learning of Adults,* vol. 6, no. 2, pp. 103-123.

Field. A 2013, *Discovering statistics using IBM SPSS,* SAGE, London.

Fink, A 1995, *How to ask survey questions, the survey kit,* SAGE, London.

Fishbein, M & Ajzen, I 1975, *Belief, attitude, intention and behaviour,* Addison-Wesley, Redding, MA.

Gage, N 1989 'The paradigm wars and their aftermath', *Teachers College Record*, vol. 91, no. 2, pp. 135-150.

Giancola, J, Munz, D & Trares, S 2008, 'First- versus continuing-generation adult students on college perceptions: are differences actually because of demographic variance?', *Adult Education Quarterly,* vol. 58, no. 3, pp. 214-228.

Guglielmino, L 1977, *Development of the self-directed learning readiness scale - doctoral dissertation,* University of Georgia: Athens.

Harvey, B, Rothman, A & Frecker, R 2006, 'A confirmatory factor analysis of the Oddi Continuing Learning Inventory (OCLI)', *Adult Education Quarterly,* vol. 56, no. 3, pp. 188-200.

Hendricks, S 2001, 'Contextual and individual factors and the use of influencing tactics in adult education program planning', *Adult Education Quarterly,* vol. 51, no. 3, pp. 219-235.

Holford, J & Mohorcic-Spolar, V 2012, 'Neoliberal and inclusive themes in European lifelong learning policy' in *Lifelong learning in Europe: Equity and efficiency in the balance,* eds S Riddell, J Markowitsch & E Weedon, Policy Press, Bristol, pp. 39-62.

Houle, CO 1961, *The inquiring mind,* University of Wisconsin, Wisconsin-Madisson.

Isaac, E, Guy, T & Valentine, T 2001, 'Understanding African American learners' motivations to learn in church-based adult education', *Adult Education Quarterly,* vol. 52, no. 1, pp. 23-38.

Jameson, M & Fusco, B 2014, 'Math anxiety, math self-concept, and math self-efficacy in adult learners compared to traditional undergraduate students', *Adult Education Quarterly,* vol. 64, no. 4, pp. 306-322.

Johnson, R, Onwuegbuzie, A & Turner, A 2007, 'Toward a definition of mixed methods research', *Journal of Mixed Methods Research,* vol. 1, no. 2, pp. 122-133.

Justice, E & Dornan, T 2001, 'Metacognitive differences between traditional-age and non-traditional-age college students', *Adult Education Quarterly,* vol. 51, no. 3, pp. 236-249.

Lee, S 2014, 'Korean mature women students' various subjectivities in relation to their motivation for higher education: generational differences amongst women', *International Journal of Lifelong Education,* vol. 33, no. 6, pp. 791-810.

Lee, W 2014, 'Opening up a road to somewhere: development of associate degree students in Hong Kong', *International Journal of Lifelong Education*, vol. 33, no. 5, pp. 607-624.

Likert, R 1929, *A technique for the measurement of attitudes,* Columbia University, New York.

Lizzio, A, Stokes, L & Wilson, K 2005, Approaches to learning in professional supervision: supervisee perceptions of processes and outcome', *Studies in Continuing Education,* vol. 27, no. 3, pp. 239-256.

Mulenga, D & Liang, Jr-S 2008, 'Motivations for older adults' participation in distance education: A study at the National Open University of Taiwan', *International Journal of Lifelong Education,* vol. 27, no. 3, pp. 289-314.

Piirainen, A & Viitanen, E 2010, 'Transforming expertise from individual to regional community expertise: a four-year study of an education intervention', *International Journal of Lifelong Education,* vol. 29, no. 5, pp. 581-596.

Porras-Hernandez, LH & Salinas-Amescua, B 2012, 'Nonparticipation in adult education: from self-perceptions to alternative explanations', *Adult Education Quarterly,* vol. 62, no. 4, pp. 311-331.

Riddell, S, Markowitsch, J & Weedon, E 2012, *Lifelong learning in Europe: Equity and efficiency in the balance,* Policy Press, Bristol.

Roosmaa, EL & Saar, E 2012, 'Participation in non-formal learning in EU-15 and EU-8 countries: demand and supply side factors', *International Journal of Lifelong Education,* vol. 31, no. 4, pp. 477-501.

Robson, C 2011, *Real world research,* Wiley, Chichester.

Rubenson, K & Desjardins, R 2009, 'The impact of welfare state regimes on constraints to participation in adult education. A bounded agency model', *Adult Education Quarterly*, vol. 59, no. 3, pp. 187-207.

Sellitz, C, Wrightsman, LS & Cook, SW 1976, *Research methods in social relations,* Holt, Rinehart & Winston, New York.

Smith, E 2008, *Using secondary data in educational and social research*, McGraw-Hill Education, New York.

Steele, B 1984, *The motivational orientations of persisting older learners in the university setting*, University of Arkansas. Unpublished doctoral dissertation.

Stockdale, S & Brockett, R 2011, 'Development of the PRO-SDLS: a measurement of self-direction in learning based on the personal responsibility orientation model', *Adult Education Quarterly,* vol. 61, no. 2, pp. 161-180.

Teddlie, C & Tashakkori, A 2009, *Foundations of mixed methods research,* SAGE, Thousand Oaks.

Thomas, G 2009, *How to do your research project,* SAGE, London.

van Rhijn, T & Lero, D 2014, 'The influence of self-efficacy beliefs for student parents attending university', *International Journal of Lifelong Education,* vol. 33, no. 4, pp. 541-555.

Waller, R, Bovill, H & Pitt, B 2011, 'Parents, partners and peers: bearing the hidden costs of lifelong learning', *International Journal of Lifelong Education*, vol. 30, no. 4, pp. 509-526.

RESPONSE TO REVIEWERS

REVIEWER 1 Beginning with the Abstract, I would encourage the author to avoid using "This paper" and "The paper" to begin all three sentences of the Abstract (as well as the first sentence of the text itself). Ideally such phrases should be avoided altogether in favor of a very brief actual summary of the central idea and the results and possible conclusions. So instead of "This paper does X," the author might begin with "Quantitative studies comprise a small percentage of the contents of major scholarly research in adult education. An examination of . . . found that . . . . Conclusions include . . . . Recommendations for quantitative research are offered." Obviously word limits for the abstract may shorten that, but the first sentence says what was done and subsequent sentences should reflect at least findings, and possibly conclusions—all without such inelegant phrases as "this paper. . . ."	Thanks, I have now reviewed the abstract.
The third line of the second section is ambiguous. Does it refer to the seven quant articles or the 57 total articles? Also the journals named should be italicized.	Journal names are now in italic throughout the text and I have made clear that these 7 refer to 7 out of 57.

Is there any rationale for selecting the years 2000-2014, other than the fairly arbitrary reason that these are the first 15 years of the 21st century? Related to that, was there a period when quantitative studies were dominant, and if so, can a transition period be identified? Or has the pendulum swung back and forth more than once?	In the text, I make it clear that this paper deepens the claim by Fejes and Nylander that most adult ed research is of a quantitative nature. I therefore follow their selection of journals. This sentence is also an important one answering your question: '*Also, professors currently supervising these doctoral students, explain Fejes and Nylander (2015), were likely trained within an era where qualitative methods gained popularity as a reaction to quantitative positivist ideas.'*
Also concerning the database, the author gives an N of 1,089 but Table 1 shows only 689, with 498 (72%) of those qualitative and 191 (28%) quantitative. Where did the other 400 go? It's possible that those 400 did not contain any of the keywords the author sought, but nowhere is	The other 400 do indeed not mention any of these keywords. I have now explained this in the text. The papers not mentioning these

that explained, and nowhere are any other categories for those 400 suggested. Many folks would assume that all adult ed research would be contained within one of the two major paradigmatic categories of quantitative or qualitative, but here we have 400, or 37% of the total N, apparently falling outside those two major categories with no mention of them at all.	keywords can be labelled as e.g. policy reviews, theoretical papers, I have explained this in the text.
This issue of categorization is a substantive problem here. First, let's look at the quant category as used here. While I appreciate the inherent difficulties of categorization, Table 1 seems too simplistic to me. First, do "Questionnaire," "Regression," and "ANOVA" really capture the scope of quant research? For example, one would hope for an "Experimental and quasi-experimental" category, given that the former is the gold standard in quant research. But the author notes that experimental research (no mention is made of quasi-experimental) is "mostly absent" in the lit—a truly shocking finding, and a serious reproach to the field if true. Or, even worse, does "mostly absent" really mean non-existent? Where are correlational and comparison studies? Moreover, there must be scores and scores of studies that use ANOVA with questionnaires, thus overlapping those two categories of the three categories. And though typically too simplistic for high quality journals, surely some of those nearly 500 quant studies	Categorization is most often a bit artificial as things are usually more complex than the way in which we want to present them for reasons of clarity and avoiding chaos. I clearly mention in the text: '*Experimental designs have been searched for but seem to be mostly absent from the adult education literature as published in the leading journals.'*

simply used descriptive statistics; so where do they fall? Or what about mixed methods studies (qual and quant together) which the author him/herself acknowledged, citing others, as a kind of third way research paradigm? The fact that "Regression" only accounted for 3.5% of the database suggests that it is too narrow a category when other possible categories that were not selected might have been significantly broader. Second, as for qualitative work, certainly many of those nearly 200 studies were historical, which I would usually consider qualitative assuming they do not get their own category. Do they all fit under "Interview" (some would), "Focus Group," or "Participant Observation"? And what about essentially polemical articles, or articles purporting to be analyses of various phenomena?	I have also referred to using Creswell in order to justify on key terms, moreover, the main aim of the article is to draw more attention to the types of quantitative studies available in the field and the materials that are being available for use in future research. I have additionally searched for 'mixed method', only resulting into 8 more hits, and I have also included correlation and quasi-experimental design in the table
When you start down this road of categorization of research into multiple, potentially overlapping categories, you invite the criticism of what you leave out, and, obversely, as in the case of "Regression," you invite the criticism of how small a category you allow to be included, especially when there are only three. As a possible alternative, what would be the possibility of dividing the studies into those that use inferential statistics and those that do not?	As stated above, the main aim of the paper is to show the reader what is out there as tools they can use in their own research, without going to much in the technical side of statistics. Using words like 'inferential' is

It may be simple, but it has the virtue of being either/or, with no overlapping categories, and it would include all types of inferential statistical procedures, not just ANOVA and regression. It also does capture the quant-qual divide. It would involve re-categorizing, but that is hardly a fatal impediment to a re-write.	just not the language people use in these types of journals, I did the search and only 2 papers write about inferential analysis. I have given some information about overlaps, e.g. 11 papers mentioning correlational analyses also undertake regression analyses.
I appreciate and accept the author's distinction between primary and secondary quantitative research. Just as an incidental fact, our program, with some disagreement, adopted the view that dissertating students doing quant work needed to do primary research. (Similarly, we strongly encouraged primary sources in historical work.) This was not to denigrate the value of secondary quant research, as we recognized that large data sets appropriately examined and tested can provide trustworthy findings and powerful conclusions that weaker data sets might not provide. But we felt that students should have the learning experience of actually collecting their own data in order to have a more complete and challenging research experience. Not collecting one's own field data seemed too major a step to be omitted.	I take your point on students having to design their own instruments, but I think it is important to make this distinction, especially because a number of datasets, like PIAAC and AES are available to researchers free of charge and it would be good to see people in the field making use of these resources.

I am uncomfortable with the "how to," tutorial tone of much of the ms. In my view, AEQ articles should not center around an author telling readers how to do something or even casually suggesting it. That might be OK for practitioner journals and magazines, but not a research journal. Exemplifying this concern are such statements as "I want to put forward some tips for working with quantitative data in the future"; "Having explored the content of these scales, I would recommend scholars to have a look at them as I am sure several of you will regularly refer to work by Bandura (1977) on self- efficacy"; and a similar sentence on p. 14 of the PDF version. Actually I am more than uncomfortable; to me this advisory, tutorial aspect is a significant problem with the paper. This is all the more true given that so much of the ms is devoted to a fairly summative discussion of numerous questionnaires, including some that do not seem to be devoted exclusively to adult learners, while others are omitted. I have no brief against the advisory comments themselves as expressed in the ms, but I am not persuaded that this is the venue for them.	OK, I get your point and I have now tried to focus more on the fact that this is a review paper, therefore mentioning the importance of coming up with different types of quantitative scales and reviewing the availability of secondary analyses, instead of writing in a tutorial mode. I have softened the tone at several places, to get rid of the tutorial tone. Scales being found in the data mining exercise have been included, also those not originally designed for, but used in the adult ed context. I strongly believe it is important for the research field to have conversations

	(and publications) about how to optimise research instruments available to them. Reviewing these can perfectly fit in an academic journal.
Tables should now be incorporated directly into the text of the ms at the appropriate place if I am not mistaken—see APA. The old "Insert Table 1 here" is a relic of pre-computer days.	OK, I have included them in the text.
It has been obvious for at least a couple of decades that qualitative research has dominated quantitative research in adult education. I doubt that this was a turning point, but I remember quite distinctly an early '90s editor of AEQ stating at a conference with some mixture of pride and relief and certainly satisfaction that the most recent issue did not have a single quant article! But even a cursory and casual review demonstrates that sophisticated quant work—by which I mostly mean experimental and quasi-experimental methods, and the statistical procedures they entail—is not especially common in adult ed, at least by comparison to qualitative work. Indeed the author found that true experimental studies (again, no mention of	I have now included quasi-experimental designs in the table, and you will see that only three articles reported on research carried out using quasi-experimental designs. Thanks for your interesting reflections on the lack of quantitative studies published in

quasi-experimental) were “mostly absent.” I was interested in the author’s hypotheses as to why the qualitative dominance is the case, and here venture a few of my own. First, somewhat akin to the author’s comment about doc students’ interest in practical problems, what percentage of students entering adult ed doc programs were math and science majors? Presuming the number to be small, as at my university, the number of quant studies is likely to be skewed at the admission process. Moreover, given the statistical expertise necessary for some quant studies, is there a general perception that qualitative research is “easier”? As a professor, I inferred that perception among many students, and perhaps especially among those who had been out of school for several years working on a career and possibly feeling just a bit intimidated by math. Third, true experimental research with human populations is indeed hard at the unfunded level primarily because random assignment to treatment groups is highly challenging, and especially with respectable numbers; and even quasi-experimental work, lacking random assignment, seems more daunting than, say, a write-up of a dozen interviews or possibly case study. (I hasten to add that case study, done WELL, is quite challenging, very time consuming, and quite demanding of a highly reflective and critical thinking researcher.) Even fairly straightforward correlational studies, e.g., Is there a statistically significant	journals. I don’t think I have ever received such a lengthy response from a reviewer!

relationship between X and Y, or no random assignment, no treatment comparison studies, e.g., Is there a statistically significant difference in scores between males and females on Questionnaire X, can intimidate numbers-anxious students. It is, after all, sometimes hard to get an appropriate N in addition to doing the statistical testing. Although I got two articles out of my dissertation, I'm still a little embarrassed that my total N was only about 40 using ANOVA. I say this as a non-quant person myself. A final hypothesis for the comparative dearth of quant research is that I have come to detect an actual bias against quant work in some circles, accompanied by accusations of it being "patriarchal" or expressions implying disdain for "positivist" research projects. Couple that with the prevailing postmodern zeitgeist, in which there is no "Truth" but merely contingent truths at best, and the result is that "positivist" approaches, with their appearance of absolutes, objectivity, and a neutral researcher stance, become downright unfashionable if not philosophically objectionable. In particular, one senses (or at least I do) a kind of animus between social justice studies, with their fairly common characteristics of researcher involvement or at least advocacy, and heavily statistical empirical studies, with their fairly common characteristics of presumed researcher neutrality, objectivity, and evidence-based conclusions. For the social justice researcher, "neutrality" and	

"objectivity" bear the stigmata of self-deception or even amorality, while for the quant researcher, "advocacy"—certainly before the data are collected—is anathema to the very notion of research.	
While I do consider this topic of the prevalence of qualitative over quantitative research in adult education—a trend quite noticeable for several years—to be of considerable interest, this present ms does not, in my view, rise to the level of publication worthiness. The categorization problem, the tutorial and sometimes too casual tone, the somewhat excessive commentary on selected questionnaires, including ones that only two or three studies had used out of the 1,089 studies coverd, collectively lead me to a negative decision. But I do not wish to vote to foreclose any possibility of publication because I do think the topic is worthy and the attempt to categorize is admirable. I don't wish to be guilty of rejecting a piece just because it wasn't the piece I would have written on that topic (a circumstance I suspect many of us have experienced), but I will venture that if I had undertaken this topic, I would have: (a) sought a categorization scheme that would have contrasted quant and qual articles in a more comprehensive and non-overlapping way; (b) expanded the interpretation and analysis of the	As said before, categorization is always a bit artificial, but needed to present work in a comprehensive way. The tutorial tone of the manuscript has been softened. Furthermore, this exercise has incorporated the range of quantitative instruments being used in research disseminated in the leading journal, it is therefore not a selection, it is what is available. I have therefore (a) included mixed methods in the table and put in a sentence explaining overlaps, (b) further focussed on the analysis on the lack of quantitative

current prevalence of quantitative research in the field; (c) not spent pages commenting on sundry questionnaires; and (d) also sought to devise an additional categorization scheme based on the content areas of the 1,089 studies, thus widening and deepening the scope of the analysis of adult education research while demanding the author's reading the abstracts of all the articles. I do realize that this last one does significantly go beyond the author's focus on the quantitative-qualitative divide and thus might not be appropriate to his/her more narrowly defined purpose. Incidentally, is this ms quant or qual? And if something else, then what?	research in the field, (c) softened the tutorial tone of the scales, focussing stronger on the review side of this article, (d) kept the focus on categorizing the content of the quantitative articles, not all 1,089 as that goes beyond the scope of this article.
REVIEWER 2 This is an interesting and important piece focusing on the lack of quantitative research in adult education by discussing the use of new as well as secondary data. I think this paper could be published after some revisions.	

1. There is no discussion about why the authors argues that these three journals are the key ones in the field. I would like some more description of these journals and why they have been chosen (besides the arguments that they are the same as Fejes and Nylander, 2015, as well as that they are based in different continents. 2. Why was the specific time period chosen?	1. I think it is important in research to build on each other's knowledge and therefore sticking to the same journals than F&N should be a good argument. 2. The F&N paper focusses on 2005-2012. A data mining exercise can deal with a larger volume of data, e.g. more than the 57 selected by F&N, as there are more than 1,000 articles included in this analysis. However, it remains important to stick to a certain time period, in order to see trends within these journals, and not so a trend through different decades, which would have been another focus.

3. There is no discussion about what the used method of data mining can do and not do. For example, just by noting specific key words does not say anything about if a paper does use one method or the other. This is illustrated further on in the paper when discussing the specific use of secondary data. I.e. one might mention a key word such as quantitative research, but this might be due only that one is referring to such tradition, not that one is authoring a paper within such tradition. This limitation is quite big and needs to be adressed in the section on methodology.	I have now been more specific about this. It should also be clear that specific data collection methods and their numbers in the Table reflect on the number of articles having used these methods. I have read all paragraphs within the text in order to distinguish between use of methods verses mentioning of methods without using them in their own research.
4. It's good that the author raises some of the skepticism of using secondary data. I think this discussion could be a bit more elaborated. E.g. that the PIAAC is designed and carried out by the OECD, an organisation with clear ideological basis and mission.	4. OK, I take your point on board and have included some extra sentences.
5. The discussion section is too limited. I would suggest that the author make some remarks on the limitation of her/his own study (the data mining), as well as elaborated a bit more on, on	5. OK, I have tried to revise the discussion section.

the one hand, the reasons for lack of quantitive research in these journals, and on the other, what quantitative research can do.	
REVIEWER 3 This paper constitutes a call for adult educators to engage in more quantitative research. The author reports his or her own quantitative research on the qualitative/quantitative mix of articles in three key journals over a 15-year period to 2014. He demonstrates quite clearly that qualitative research dominates. The article is well worth publishing but I think it could be improved in a few ways. Some suggestions are set out below: 1. There could be more emphasis on the kinds of questions that demand a quantitative research approach. What kinds of questions are not been asked and why are they important? How can quantitative research enrich the knowledge base of adult education? 2. There are parts of this article which are too 'textbook like' – e.g .the para beginning p.9 line 26 and parts of the preceding para. These need to be edited.	1. OK, I have tried to make this more explicit in the section on quantitative versus qualitative work. 2. Thanks, similar to my response to Reviewer 1, I have tried to soften the tutorial style tone of this paper.

3. The author could address the critique of positivist research as a way of engaging the reader in the issues. e.g. the critique that positivist research is often based on untenable assumptions, or the view that extraneous factors cannot be controlled or randomised, or the claim that data is presented as window dressing to make a paper 'scientific' which then lends legitimacy to speculation 'beyond the data'.	3. This is included within the section on quantitative versus qualitative research, discussing it's strength and weaknesses
4. It would have been good if the author had searched the key word 'percentage'. I have often seen qualitative research that actually asks questions for which quantitative research is more appropriate. Often this leads to an inexpert reporting of percentages.	5. I had a search for 'percentage' and found that this is also being used in background sections of text, providing e.g. contextual information of the country in which the research takes place.
5. The discussion section hypothesises a skills deficit in the field of adult education that explains the underrepresentation of quantitative research. This may be so but this is very speculative. Some comment or data on the dearth of quantitative methods in research courses	5. Sections discussing skills deficit in the adult education field have been backed up with statements from previous publications, e.g. Fejes & Nylander: '*Also, professors*

in key adult education faculties would have been more convincing. Also I think the author needs to return to the issue of the questions being asked.	*currently supervising these doctoral students, explain Fejes and Nylander (2015), were likely trained within an era where qualitative methods gained popularity as a reaction to quantitative positivist ideas.'*